

REMARKS

Claims 1-5, 7-17 and 19-22 are currently pending in the subject application and are presently under consideration. Claims 1, 14, 17, 21, and 22 have been amended as shown at pages 2-6 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1-5, 7-17 and 19-22 Under 35 U.S.C. §103(a)

Claims 1-5, 7-17 and 19-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Safranek et al. (US 2004/0193755) in view of Kondratiev et al. (US 6,922,740). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Sanfranek *et al.* and Kondratiev *et al.*, alone or in combination, do not teach each and every element of applicants' invention as recited in the subject claims.

[T]he prior art reference (or references when combined) must teach or suggest all claim limitations. *See* MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *See In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Independent claim 1 (and similarly independent claims 14, 17, 21 and 22) recites *an access data store that stores access information associated with memory, the access data store comprising an access table, the access table comprising a source identifier field, a memory address field and an access attribute field, the access attribute field distinguishes between read, read and write, write, and no access to indicate read, read and write, write, or no access for a combination of source associated with the access attribute and memory range associated with the access attribute identified in the source identifier field and memory address field; and a memory controller that employs the access information to determine whether a requested direct memory access is permitted and rejects the requested direct memory access if it is not permitted.*

As conceded in the Office Action, Sanfranek *et al.* does not teach or suggest the aforementioned novel aspects of applicant's invention as recited in the subject claims. The cited art discloses a method for preventing non-CPU devices from accessing protected memory. This

is accomplished by maintaining a NODMA memory cache where each bit in the cache represents a page of memory. The setting of the bit (0 or 1) determines if the associated memory page is protected. If a memory access request for a page comes from a non-CPU device and the NODMA cache indicates that the page is protected, the access will be denied. However, this provides very fine control of memory pages, but lacks the combined source, memory, and access type control of the subject claim. Kondratiev *et al.* is cited to make up for the above noted deficiencies of Sanfrank *et al.* Kondratiev *et al.* teaches a system for controlling DMA access from devices. The cited art discloses a table that contains rows containing device ID field, read memory range field, write memory range field and duration field. This provides an access control list that indicates memory ranges a device is allowed to access. The table *only* indicates memory ranges that are allowed access. It does not provide the ability to directly specify a memory range that is not allowed access. Moreover, read and write access are indicated in two separate fields. The access attribute in applicant's claimed invention provides both allowed and disallowed access information including access type within a single field. This provides allowed and disallowed control information to be stored together, as well as providing both types of information for a single device. For example, the table can have an entry for device A indicating read access for memory range X and another entry for device A indicating no access for memory range Z. In another example, the table could have an entry for device B indicating no access for memory range Y, thereby allowing it access to all memory ranges except Y. Using the combination of a source identifier field, a memory address field and an access attribute field to define allowed and disallowed access provides for more robust definition of memory access privileges using reduced table space.

Accordingly, applicants' representative respectfully submits that Sanfrank *et al.* and Kondratiev *et al.*, alone or in combination, fail to teach or suggest all limitations of applicants' invention as recited in independent claims 1, 14, 17, 21 and 22 (and claims 2-5, 7-13, 15, 16, 19 and 20 that depend there from) and thus fails to make obvious the subject claimed invention. For this reason, this rejection should be withdrawn.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP553US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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